

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

1. (cancelled without prejudice)
2. (new) An optical communication system for transmitting optical signals transmitted on a plurality of first optical transmission lines to a plurality of third optical transmission lines via a second optical transmission line, comprising:
  - a first optical transmission unit connected to said first and second optical transmission lines, for receiving first optical signals transmitted on said first optical transmission lines and transmitting a second optical signal obtained from said first optical signals to said second optical transmission line; and
  - a second optical transmission unit connected to said second and third optical transmission lines, for receiving said second optical signal from said second optical transmission line and transmitting third optical signals obtained from said second optical signal to said third optical transmission lines,wherein said first optical transmission unit extracts optional information included in a plurality of first overheads of said first optical signals and enters said optional information extracted into a region which is not occupied for use in a second overhead of said second optical

signal and transmits said second optical signal comprising said optional information in said second overhead to said second transmission line; and

said second optical transmission unit extracts said optional information in said second overhead of said second optical signal and enters said optional information extracted into a plurality of regions allotted for each of said optional information in a plurality of third overheads or third optical signals and transmits said third optical signals comprising said plurality of optional information in said third overheads to said third transmission lines.

3. (new) The optical communication system according to claim 2, wherein said second optical transmission line transmits said second optical signal faster than said first and third optical transmission lines, and said first optical transmission unit multiplexes said first optical signals to obtain said second optical signal, and said second optical transmission unit demultiplexes said second optical signal to obtain said third optical signals.

4. (new) The optical communication system according to claim 3, wherein said first optical transmission unit multiplexes said optional information and enters said optional information multiplexed into said region which is not occupied for use in said second overhead of said second optical signal multiplexed, and said second optical transmission unit demultiplexes said optional information multiplexed and enters said optional information demultiplexed into said plurality of said regions allotted for said optional information in said plurality of third overheads of said third optical signals demultiplexed.

5. (new) The optical communication system according to claim 2, further comprising:

a system management unit connected to said first and second optical transmission units, for indicating said optional information to be extracted and said region which is not occupied for use in said second overhead to said first and second optical transmission units.

6. (new) An optical communication system for transmitting optical signals transmitted on a plurality of first optical transmission lines to a plurality of third optical transmission lines via at least one second optical transmission line, comprising:

a first optical transmission unit connected to said first and second optical transmission lines; and

a second optical transmission unit connected to said second and third optical transmission lines; wherein said first optical transmission unit extracts first information concerning a number of errors included in a plurality of first overheads of first optical signals received from said first optical transmission lines and adds a number of errors detected from said first optical signals to said number of errors of said first information to obtain second information concerning a number of errors and enters said second information into a region which is not occupied for use in a second overhead of a second optical signal and transmits said second optical signal comprising said second information in said second overhead to said second optical transmission line, and

said second optical transmission unit extracts said second information in said second overhead of said second optical signal received from said second optical transmission line and adds a number of errors detected from said second optical signal to said number of errors of said second information to obtain third information concerning a number of errors, and enters said third information into regions allotted for said third information of a plurality of third overheads of third optical signals and transmits said third optical signals comprising said third information in said third overheads to said third transmission lines.

7. (new) The optical communication system according to claim 6, wherein said second optical transmission line transmits said second optical signal faster than said first and third optical transmission lines, and said first optical transmission unit multiplexes said first optical signals to obtain said second optical signal, and said second optical transmission unit demultiplexes said second optical signal to obtain said third optical signals.

8. (new) The optical communication system according to claim 7, wherein said first optical transmission unit multiplexes said first information to obtain said second information and enters said second information multiplexed into said region which is not occupied for use in said second overhead of said second optical signal multiplexed, and said second optical transmission unit demultiplexes said second information multiplexed to obtain said third information and enters said third information demultiplexed into said plurality of regions allotted for said third information in said plurality of third overheads of said third optical signals demultiplexed.

9. (new) The optical communication system according to claim 6, further comprising:

a system management unit connected to said first and second optical transmission units, for indicating information concerning a number of errors and said region which is not occupied for use in said second overhead to said first and second optical transmission units.

10. (new) An optical communication system for transmitting optical signals transmitted on a plurality of first optical transmission lines to a plurality of third optical transmission lines via at least one second optical transmission line, comprising:

a first optical transmission unit comprising:

a plurality of first optical signal receiving portions connected to each of said first optical transmission lines, for receiving a plurality of first optical signals from said first optical transmission lines and extracting specified information included in a plurality of first overheads of said first optical signals;

a first overhead processing portion connected to said plurality of first optical signal receiving portions, for arranging said specified information extracted; and

a first optical signal transmission portion connected to said first overhead processing portion, for entering said specified information arranged by said first overhead processing portion into a region which is not occupied for use in a second overhead of a second optical signal and for transmitting said second optical signal comprising said specified information in

said second overhead to said second optical transmission line; and

a second optical transmission unit comprising:

a second optical signal receiving portion connected to said second optical transmission line, for receiving said second optical signal from said second optical transmission line and extracting said specified information in said second overhead;

a second overhead processing portion connected to said second Optical signal receiving portion, for arranging said specified information extracted; and

a plurality of second optical signal transmission portions connected to said second overhead processing portion, for entering said specified information arranged by said second overhead processing portion into regions allotted for said specified information of a plurality of third overheads of a plurality of third optical signals and for transmitting said third optical signals comprising said specified information in said third overheads to said third optical transmission lines.

11. (new) The optical transmission system according to claim 10, wherein said first overhead processing portion arranges said specified information according to kinds of information, said second overhead processing portion arranges said specified information so that said specified information are entered into said regions allotted for said specified information of said third overheads.

12. (new) The optical transmission system according to claim 10, wherein said first

optical signal transmission unit comprises a first control portion for indicating said specified information to be extracted to said first optical signal receiving portions, indicating a method of arranging said specified information to said first overhead processing portion and indicating said region which is not occupied for use in said second overhead to said first optical signal transmission portion, and

said second optical signal transmission unit comprises a second control portion for indicating said region which is not occupied for use of said second overhead to said second optical signal receiving portion and a method of arranging said specified information to said second overhead processing portion.

13. (new) The optical transmission system according to claim 12, further comprising a system management unit connected to said first and second optical signal transmission units, for indicating said specified information to be extracted and said region which is not occupied for use in said second overhead to said first and second control portions.